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Nerve mediated relaxation of the human internal anal sphincter the role of nitric oxide.

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The aim of this study was to determine if nitric oxide (NO) is the non-adrenergic, non-cholinergic neurotransmitter, released by enteric inhibitory nerves, which mediates relaxation of the human internal anal sphincter. Isolated muscle strips were mounted for isometric tension recording in superfusion organ baths. Sodium nitroprusside, an exogenous donor of NO, relaxed the strips in a concentration dependent manner. In the presence of atropine and guanethidine, transmural field stimulation produced tetrodotoxin sensitive relaxations, which were inhibited in a dose dependent and enantiomer specific manner by antagonists of NO synthase; completely by L-nitroarginine and partially by L-N-monomethyl arginine. The effect of these antagonists was reversed by L-arginine but not D-arginine. Oxyhaemoglobin a scavenger of nitric oxide, also abolished the relaxations but methaemoglobin had no such effect. These results strongly suggest that NO is, or is very closely associated with, the non-adrenergic, non-cholinergic neurotransmitter mediating neurogenic relaxation of the human internal anal sphincter.

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